

ANNUAL SANITARY REPORT

OF THE

PROVINCE OF ASSAM

FOR THE YEAR

1902.

BY

COLONEL C. W. CARR-CALTHROP, M.D., Ch.D., I.M.S.,
PRINCIPAL MEDICAL OFFICER AND SANITARY COMMISSIONER, ASSAM.



SHILLONG:

PRINTED AT THE ASSAM SECRETARIAT PRINTING OFFICE.

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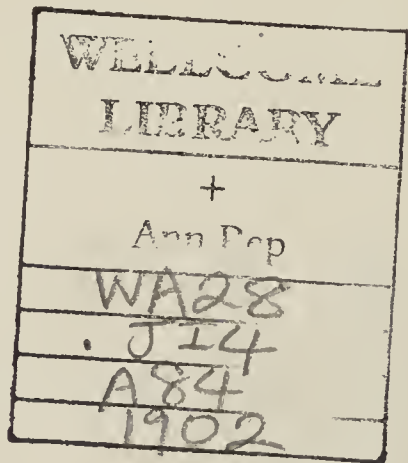
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FROM

COLONEL C. W. CARR-CALTHROP, M.D., Ch.D., I.M.S.,
Principal Medical Officer and Sanitary Commissioner, Assam,

TO

THE SECRETARY TO THE HON'BLE THE CHIEF
COMMISSIONER OF ASSAM.

Shillong, the 29th April 1903.

SIR,

I HAVE the honor to submit the Annual Sanitary Report of the Province of Assam for the year 1902, together with the prescribed statements, *viz.*, 10 Imperial and 1 Provincial.

2. The explanation of the delay in the submission of the report has been given in the body of the report (see paragraph 1), and I would beg to reiterate the remark made in my covering letter of the Sanitary Report for 1899, that "it would be much better if the date for the submission of this report were postponed until 1st May of each year," or else that some other procedure should be adopted to ensure the various district returns reaching me much earlier than they do at present.


3. This report covers 13 pages, instead of the 12 prescribed as a maximum; but when that number was fixed, no allowance was made for remarks on meteorology, which have taken a little over one and a half pages. Next year, however, half a page will probably suffice, and the report be reduced to the prescribed maximum length.

I have the honor to be,

SIR,

Your most obedient Servant,

C. W. CARR-CALTHROP, M.D., Ch.D.,
Colonel, I.M.S.,
Principal Medical Officer and Sanitary Commissioner, Assam.



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TABLE OF CONTENTS.

	PARA.
General	I
Census figures	2
Meteorology	3
Meteorological divisions	4
Surma Valley	5
Prices of common rice	<i>ib.</i>
Dhubri	6
Sibsagar	7
Assam	8
Births and deaths registered	9
Registration in compulsory areas	12
Registration in hill districts	15
Mortality at different ages	16
Child mortality	18
Youthful mortality	19
Inspection of village registers	20
Chief causes of mortality	29
Cholera	30
Cholera in tea gardens	31
Cholera on steamers and at riverside depôts	32
Small-pox	33
Fevers	34
<i>Kálá-ázár</i>	35
Comparative ratios of deaths from bowel-complaints and fever in the Lakhimpur district	38
Injuries and death-rate from them	39
All other causes	40
General	41
Municipal expenditure and sanitary works	42
Sanitary improvements and rural areas	43
Village sanitary inspection books	44
Sale of quinine	45
Drying machine	46
Mosquito brigades	47
Railway camps... ..	48
Sanitary Board... ..	49

ANNUAL SANITARY REPORT OF THE PROVINCE OF ASSAM FOR THE YEAR 1902.

SECTION I.—METEOROLOGY.—[See para. 3 to 8.]

SECTION II.—EUROPEAN ARMY.—[No remarks.]

SECTION III.—NATIVE ARMY.—[No remarks.]

SECTION IV.—JAILS.—[No remarks.]

SECTION V.

GENERAL POPULATION—VITAL STATISTICS.

I was Principal Medical Officer of the Assam Military District and Sanitary Commissioner for the Province of Assam during the whole of the year and made the usual tours of inspection. This report which was due to the Chief Commissioner on April 10th, has been, as usual, much delayed by several district returns, which were due at my office on February 1, not having been received until late in March: the vital statistical returns for the Sylhet district did not reach me until April 8th and the Annual Sanitary Report for that district arrived on April 14th. Under these circumstances, considerable delay in the preparation and submission of the Provincial Report was absolutely unavoidable. The figures of the census of 1901 have been used throughout this report.

2. The population of the areas under registration in the Province are located as follows. In the Surma and Brahmaputra Valleys, 5,275,706; in the Khasi and Jaintia Hills, 47,294; in the Garo Hills, 31,537; and at Kohima in the Naga Hills, 3,093. The total of these is 5,357,630, to which, if the number of people living in areas not under registration, *i.e.*, in other parts of the above mentioned three hill districts and the North Cachar and Lushai Hills, to the number of 484,248, and the 284,465 of Manipur be added, a gross total of 6,126,343 is obtained. The birth and death-rates for the hill districts are given separately below (see paragraph 15), and for the general provincial ratios, the figures of the Surma and Brahmaputra Valleys, *viz.*, 5,275,706, are used.

3. In accordance with instructions issued by the Army Sanitary Commission and the Hon'ble the Chief Commissioner of Assam, the following short notes on the meteorology of some districts and the ruling rates of food-grains are submitted; but at the outset I beg to say that so far as I can judge the variations of the latter have little if anything to do with the birth-rate. The people of Assam are very well off, food is plentiful everywhere and life taken so easily that only a minimum of work is done anywhere; the high rates charged for coolies and the disinclination of the people to accept remuneration 2 or 3 times as high as in other provinces for what work they do, show that they have plenty to eat and do not want more money; while the comparatively enormous sums they spend on weddings would go to show that marriages and probably the consequent birth-rate do not depend upon the bazar *nerik*. A year's salary is quite a usual amount for a Sylheti clerk to spend on celebrating his daughter's wedding. What does such a person care for the weather or the price of paddy.

4. There are only three meteorological observatories in the province, *viz.*, at Silchar, Dhubri, and Sibsagar; so, for purposes of these remarks, Assam may be supposed to consist of three regions, *viz.*, the Surma Valley comprising the Sylhet and Cachar (Silchar) districts; the lower part of the Brahmaputra Valley, comprising the Goalpara (Dhubri), Kamrup (Gauhati), and Nowgong districts; and the upper part of this valley comprising the Darrang (Tezpur), Sibsagar and Lakhimpur (Dibrugarh) districts; or for short, the Surma Valley and Lower and Upper Assam.

5. The temperature and climatic conditions generally of the Surma Valley are practically the same as those of Lower Bengal, which the country much resembles. The rainfall averages about 120 inches; for the last four years 1899—1902, the amounts were 138, 108, 105 and 119 inches omitting decimals. The mean maximum temperatures for the years 1899—1901 were 85·6, 87·8, and 87·4; the mean minimum temperatures were 67·1, 68·0 and 67·6; and the mean daily temperatures 76·4, 77·9, and 77·5. I do not quote the figures for 1902, as the statements submitted to me contain various errors which the time at my disposal does not enable me to check and rectify:

Suffice it to say that no unusual meteorological phenomenon was observed; the year 1902 was one of abundant though not excessive rainfall, and the recorded maximum and minimum temperatures were naturally rather below and above the normal, respectively.

Actual prices of common rice for last four years shown in rupees and decimals per maund.

	1898.	1899.	1900.	1901.	Average.	1902.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Sylhet ...	3'29	2'21	2'71	3'79	3'00	2'94
Goalpara ...	3'19	2'45	2'75	3'40	2'95	3'19
Lakhimpur ...	3'69	2'97	3'27	4'07	3'50	3'75

The staple food of this region is rice, and practically rice only, wheat and gram being merely foreign importations. The actual prices of this commodity at three stations in Assam for the past four years and the rates for 1902, as compared with the average of these, is shown in the inset. I have taken the average for 4 years only, as the year 1897 was that of the great Indian earthquake, and prices of all articles were much disturbed thereby. This little inset

shows that the price of the chief article of diet over this large district (Sylhet) was just a trifle less than the average, and it probably did not affect either the birth or death-rates to any recognisable extent.

6. The rainfall in the Lower Assam districts is usually some 20 to 30 inches less than in Sylhet; the amounts for the last four years were 99, 83, 70, and 120. The heavy fall in 1902 produced widely extending floods in portions of the Goalpara and Kamrup districts, and may possibly have thereby caused some increase in malarial fevers. The mean maximum temperatures for the four years 1899—1902 were 81, 83, 83, and 82; the mean minimums were 67, 68, 68, and 67 nearly; and the mean daily temperatures were 74, 75, 75, and 74. No remarkably high or low temperature was recorded during 1902. The price of rice was a little higher than the average (3'19 against 2'95 rupees per maund), but I do not consider that this would affect the birth-rate, as the bulk of the inhabitants of this region are producers and exporters of rice and benefit by a rise in price.

7. The upper portion of the Assam Valley is cooler than the lower tracts and much more so than the Surma river districts. The rainfall is very much about the same as at Dhubri, the amounts registered for the four years 1899—1902 being 93, 89, 91, and 95. The mean maximum temperatures for the years 1899—1901 were 80, 81, and 81; the mean minimums were 65, 66, and 66; the mean daily temperatures were 72, 74, and 73. I do not quote the figures for 1902, as the district returns give the maximum and minimum recorded and not the means of those observations; but the year 1902 presented no abnormalities and corresponded closely with the average of the three preceding ones. The price of rice at Lakhimpur (Dibrugarh) is higher than elsewhere in the province owing to cost of carriage from districts lower down the river; but I agree with the Civil Surgeons concerned that the birth and death-rates were not affected to any appreciable extent by variations in temperature and rainfall, or the cost of rice and other food-grains.

8. The climate of different parts of Assam varies so much that no one general description would apply to all, but the following notes which differ only a little from those submitted in my letter No. 2516, dated the 2nd July 1902, to the Sanitary Commissioner with the Government of India will show what the different seasons are. At Shillong itself the year may be divided into—

- (1) The cold dry season, lasting $3\frac{1}{2}$ months, from November 1st to February 14th.
- (2) The warm dry season, $2\frac{1}{2}$ months, from February 15th to April 30th.
- (3) The hot damp season, 6 months, from May 1st to October 31st.

In the plains of the Surma Valley I should divide the year into—

- (1) The cold season, 3 months, November 16th to February 14th.
- (2) The hot season, $2\frac{1}{2}$ months, February 15th to April 30th.
- (3) The rainy season, $6\frac{1}{2}$ months, May 1st to November 15th.

In the lower Brahmaputra Valley the seasons are much the same; but in the upper districts, say Sibsagar and Lakhimpur, I would estimate—

- (1) The cold season, 4 months, November 1st to February 28th.
- (2) The hot season, 2 months, March 1st to April 30th.
- (3) The rainy season 6 months, May 1st to October 31st.

But of course all these divisions are arbitrary and vary a good deal in different years. In the Surma Valley the unhealthy season set in last year rather earlier than usual, over 9,000 deaths having been registered in each of the months October, November, and December. October is not usually so unhealthy, but the reason assigned in the district report is the increase of cholera, and that several outbreaks of small-pox were occasioned by the operations of *Ganaks*. The total mortality rose from 77,190 in 1901 to 87,915 in 1902. In the Assam Valley, the same three months were

the worst, probably owing to an increase of malarial fever in the autumn, due to unusually high floods; but the total mortality shrank from 69,749 in 1901 to 65,155 in 1902. Taking the province as a whole, the number of deaths in the two years were nearly the same, being 146,939 and 153,070 for 1901 and 1902, *i.e.*, ratios per mille of 27·85 and 29·01, respectively.

9. The marginal statement shows the average birth and death-rates as registered in

Births and deaths registered.

Province.	Average for nine years.		Actual for 1902.	
	Birth-rate.	Death-rate.	Birth-rate.	Death-rate.
Assam ...	32·50	34·14	34·21	29·01
Bengal ...	37·11	31·89	40·14	33·43
Central Provinces	33·44	39·65	48·29	25·82
Madras ..	28·66	21·19	28·20	20·20
Burma ...	32·70	25·37	31·57	21·16
Bombay ...	32·87	36·85	34·16	39·04
Agra and Oudh .	38·80	32·39	45·84	32·54
Panjab ...	41·59	33·39	43·80	44·10
North-West Frontier Province ...	...	...	33·60	24·40

nine provinces of British India during the last nine years and the actuals for the last year, from which it appears that the general health of the people of Assam has been extremely good during 1902. The reported birth-rate is low, as compared with that of Bengal and the Central and United Provinces and the Panjab, and the death-rate is naturally also lower than in those regions; but I think the actual rates are much higher, and were the registration not so defective, very different figures would be presented. The rates from other provinces are given exactly as received from the officers concerned. The results

of famine and plague are still clearly evident in Bombay and the Panjab.

10. Taking the figures as reported as a basis of consideration, it appears that in both the valleys as well as in the whole province the birth-rates show an increase over the death-rates. As in the previous year, the death-rate for Darrang exceeds the birth-rate. The excess of births over deaths is nearly twice as much in the Brahmaputra Valley as in the Surma Valley, owing to increased mortality in the Sylhet district from cholera and small-pox. In the whole province, the birth-rate exceeds the death-rate by 5·20 per mille, which is probably nearly the truth.

11. The average birth-rate for the Surma Valley for the last 9 years was 35·03 and the actual for 1902, 36·90; for the Brahmaputra Valley the average was 29·92 and the actual for 1902 was 31·48. The average and actual death-rates for the Surma Valley for the same periods were 33·97 and 33·99, respectively. In the Assam Valley, the figures are 34·41 and 24·88. The figures furnished from the Sibsagar district show a rate of mortality of 18·14 only, from Nowgong 21·35, from Lakhimpur 22·14, and from Kamrup 22·99. It is impossible to suppose that these figures even approximately represent the real state of affairs, and effective professional criticism is equally impossible.

12. Appendix No. I is a provincial statement which shows the details of registration in areas in which it is compulsory. The birth-rates reported and registered in some of the towns fall far below the estimated probable rates, and the death-rates are so enormously various and so small in certain areas that there is no question that the registration in these compulsory areas too is very defective, even if allowance be made for the fluctuating nature of the town population. The birth-rates for Silchar (17·18), Sylhet (19·15), Dhubri (19·53), do not come up to even half the estimated rates, while that of Mangaldai (12·66) shows barely one-third. I repeat again that arguments founded on such bases are useless, a mere waste of time and paper. The rate reported from Tezpur in 1901 was 12·88. I noted in my report for that year that the state of registration at that town was so much worse than in other places as to be practically useless. This year Tezpur reports a rate of 24·57. If the local authorities be similarly spurred for two years more the returns for 1904 may be probably fairly correct.

13. The birth-rate of Barpeta (41·24), although a good deal lower than in 1901, is again far higher than elsewhere in the province, and the idea which I formed in 1900 that Hindu women resort to it, as a sacred place, especially favorable for accouchement, is no doubt correct. The low death-rate 34·48 is to be explained by the fact that as soon as, or shortly after they are able to travel, the women take themselves and their infants back to their homes. The heavy floods of June, July, and August 1902 may perhaps have prevented many women from going into Barpeta for confinement.

14. The death-rates vary enormously and in many instances cannot be advantageously criticised owing to the numbers from which the ratios are calculated being so small. From areas containing over 3,000 inhabitants, the recorded death-rate varies from 15·86 at Sunamganj and 19·12 at Silchar to 44·51 at Golaghat and 46·73 at North Lakhimpur, but I am not aware of any particular circumstances which preserved the people at the first two named places, and destroyed them at the latter. The town of Sylhet shows a wonderful improvement since last year, the death-rate having fallen

from 40·74 to 27·64, at least so the recorded figures say.

15. As stated in paragraph 2, a certain amount of registration is effected in some portions of the hill districts, and the figures furnished for 1902 show for a part of the Khasi and Jaintia Hills district a birth-rate of 25·56 and a death-rate of 21·36, as compared with 27·55 and 26·30 last year; for the small town of Kohima in the Naga Hills the rates work out to 35·89 and 21·99. I should not be surprised to learn that some Naga women come into Kohima to be near medical aid when expecting their confinement. Last year I observed that the rates 46·23 and 37·6 reported from the Garo Hills were not likely to be correct, but probably included vital occurrences taking place amongst the population of non-registration areas as well as of registration ones. Greater care has accordingly been taken in 1902, and the rates now reported are 28·38 and 21·78, which are probably more correct.

16. The statement in the margin, which is calculated on the results of census figures, shows the average infant mortality for the different provinces of British India for the last nine years, *i.e.*, 1893 to 1901. Our average for males (199·67) is almost the same as that of Bombay (197·66), and the figures for Madras (142·11) suggest that there is some difference in the manner of the collection of data or making calculations from them. The actual recorded mortality for Assam for 1902 was 198·53 (male), 179·61 (female), and 189·00 (all births), rates which, though less than the average, are nearly ten per mille higher than in 1901, this might however have been expected as 1901 was an unusually healthy year. The rates, for all provinces calculated according to the formula

Province.	Males.	Females.
Assam ...	199·67	180·11
Bengal ...	261·72	220·52
Central Provinces	388·89	335·97
Madras ...	142·11	123·60
Burma ...	236·72	170·70
Bombay ...	197·66	171·36
Agra and Oudh	324·43	298·99
Punjab ...	232·51	229·91

Deaths of children under 1 year,
Births registered during the year,

$\times 1,000$ are for 1902 as follows:

Assam 203·38, Bengal 200·46, Central Provinces 213·30, Madras 168·0, Burma 196·11, Bombay 196·32, Agra and Oudh 243·65, Panjab 237·43, and North-West Frontier 182 (male) and 175 (female).

17. The statement annexed shows the infantile death-rate for different districts in

Name of district.	Death-rate per mille under one year of age children calculated on an actual number of births.		
	Male.	Female.	Both sexes.
Surma Valley—			
Cachar ...	212·20	208·39	210·31
Sylhet ...	248·26	239·16	243·83
Average ...	242·92	234·45	238·79
Goalpara district	237·41	237·97	237·68
Brahmaputra Valley—			
Kamrup ...	146·99	147·86	147·41
Darrang ...	191·32	195·30	193·25
Nowgong ...	124·71	125·88	125·26
Sibsagar ...	107·67	96·88	102·97
Lakhimpur...	102·62	100·37	101·54
Average of five districts .	136·06	134·55	135·34
Average of the whole province ...	205·53	201·10	203·38

Assam. The rates for the Surma Valley are for 1902, 242·92 (males), 234·45 (females), and 238·79 (all births); for the Goalpara district 237·41 (males), 237·97 (females), and 237·68 (all births); for the average of the remaining five districts of the Brahmaputra Valley the ratios are 136·06 (males), 134·55 (females), and 135·34 (all births). These figures are obviously so imperfect as to be worse than useless. The averages for the whole province, including, as I suppose I must the Upper Assam figures, are 205·53 (males), 201·10 (females), and 203·38 (all births).

18. In 1902 the child mortality, *i.e.*, deaths up to five years of age, including deaths of infants, was in the Cachar district 79·44 (males), 77·95 (females), and 78·70 (persons). In the Sylhet district the ratios were 99·80 (males), 92·20 (females), and 95·91 (persons). In the Goalpara district the corresponding figures are 98·54, 88·48, and 93·37, respectively. But if the deaths of children under one year of age, *i.e.*, the infantile mortality, be excluded, the ratios in the Cachar district fall to 34·22 (males), 34·47 (females), and 34·35 (persons); in the great Sylhet district to 42·32 (males), 43·45 (females), and 42·90 (persons); while in the Goalpara district the loss is much the same as in Cachar, being 35·37, 34·41, and 34·87, respectively. From the age of 5 to 10 the death ratios are of course very much less, being for the Cachar district 14·66, 12·11, and 13·40;

for the Sylhet district, 17·22, 12·88 and 15·04; while from the figures furnished from the Goalpara district the death ratios for this period are calculated to be 10·64, 10·43, and 10·54. The figures for the Darrang district may be more correct, but those for the other four districts of the Assam Valley districts are not worth analysis.

19. For the age period 10-15, the reported death-rates in the Cachar district were 12·99 (males), 12·94 (females), and 12·97 (persons). In Youthful mortality. Sylhet the corresponding ratios were 15·30, 13·82, and 14·66, and in the Goalpara district, 8·86, 9·47 and 9·11. It seems impossible to explain on any scientific basis why the death-rate of young persons should be only 9·11 in the Goalpara and 14·66 in the Sylhet district, nor it is possible to give any scientific reason for the death-rate of young persons having fallen in the Goalpara district from 14·39 in 1901 to 9·11 in 1902.

20. A brief summary of the results of inspection of village registers of births and deaths by the police and vaccination establishment is given below :—
Inspection of village registers.

21. *Cachar District*.—The investigating police officers spent 496 days in checking vital statistics in 1,368 chaukidari beats, against 455 days and 1,004 chaukidari beats in 1901. Enquiries were made respecting 7,770 births and 6,869 deaths with the result that 81 births and 85 deaths were found to have been unreported; these were afterwards reported to the Deputy Commissioner.

The Inspector of Vaccination tested the registers of 65 villages and ascertained that 154 births and 112 deaths had occurred in them, and he did not detect any omissions in the entries.

The amount of work done by the police in checking vital statistics is very valuable, and shows that the registration is in an unsatisfactory condition. The Inspector of Vaccination's work in this direction was as usual perfunctory and useless.

22. *Sylhet District*.—Two thousands four hundred and nine villages were visited by the police and 1,053 days spent in checking vital occurrences; the result was that out of 18,071 births and 15,860 deaths enquired into, 1,117 births and 947 deaths were found not to have been reported.

The Inspectors of Vaccination visited 132 villages in which they found 1,665 births and 1,348 deaths had occurred, out of which 20 births and 16 deaths had not been entered in the village registers.

Thanks are due to the District Superintendent of Police of this district for the very valuable help afforded by the officers and men of his force, and it is to be hoped that he will not allow their vigilance to be relaxed. The Inspectors of Vaccination did very little more than one half of the work they did in 1901. I have directed the Civil Surgeon to report the names and work actually performed by each of these men, whom I propose to punish in due course.

23. *Goalpara District*.—The police visited 2,678 villages in 2,282 days and enquired into 15,866 births and 11,497 deaths (*i.e.*, nearly $\frac{3}{4}$ ths of the total numbers registered during the year), with the result that 354 births and 207 deaths were found to have never been reported.

The Inspector of Vaccination tested the vital statistical registers of 91 villages, in which he ascertained 1,473 births and 998 deaths to have occurred. Of these, 7 births and 7 deaths were found to have been left unreported.

The help of the police has been of great service in this district, and owing to this the condition of the village registers appears to be improving. The Inspector of Vaccination examined the entries relating to about one-tenth of the number tested by the police, but he only discovered one-fiftieth of the number of admissions. In 1900 I noted of this man that his work was perfunctory and inaccurate; in 1901 I stated that he had shown great apathy and neglect. These remarks may be read together for 1902.

24. *Kamrup District*.—In 723 days the police visited 883 villages with a view to check return of vital occurrences, against 390 days spent in visiting 536 villages in 1901. Out of 4,018 births and 2,793 deaths enquired into in 1902, 1,240 births and 816 deaths were found to have been unreported.

The registers of 78 villages were inspected by the Native Inspector of Vaccination. He ascertained that 785 births, 943 deaths had occurred, but discovered none that had been left unreported.

I have to repeat the remark I made last year, *viz.*, that the registration in this district is bad as usual, and had it not been for the help of the police, for which thanks are due, the figures relating to the vital statistics of this district might with advantage have been excluded from the Provincial Report. The work done by the Inspector of Vaccination was of no value.

25. *Darrang District*.—Out of 1,004 births and 1,115 deaths dealt with by the police in 502 villages, 71 births and 99 deaths were found to have been left unreported.

The Inspector of Vaccination examined the entries in the registers of 28 villages, in which 99 births and 66 deaths were ascertained to have occurred, all were entered in the registers. The Inspector of Vaccination of the Mangaldai subdivision did not furnish any information regarding his scrutiny of village registers.

The Tahsildars, Mauzadars, Supervisor Kanungoes, and Mandals of this district looked into the registers of 634 villages, but the result is not stated.

In 1900 the enquiries instituted by the police showed that about 5·7 per cent. of deaths and 2·5 of births in the villages they visited were left unreported. In 1901 these rates rose to 8·5 and 8·6, in 1902 the figures work out to 8·8 and 7·0, but I should imagine that these figures might be doubled or trebled without exceeding the truth.

26. *Nowgong District*.—The police spent 684 days in visiting 845 villages. The results of these visits were that, out of 1,753 births and 1,270 deaths enquired into, 59 of the former and 39 of the latter kind were discovered to have been unreported. The Vaccination Inspector inspected the registers of 60 villages against 196 in 1901, and discovered that 320 births and 25 deaths had occurred; of these 34 births and 38 deaths had been left unreported.

The work done by the police in this district was better than in 1901, but still it left much to be desired. In 1900 they enquired into 5,365 cases, in 1901 into 2,418 only, and in 1902 into 3,023. The Inspector of Vaccination only visited 60 villages as against 196 in 1901 and 95 in 1900. I have called for a special report on him, but have not time to include the result in this epitome.

27. *Sibsagar District*.—Enquiries were made by the police in 687 villages regarding 1,817 births and 1,165 deaths, against 2,302 births and 1,114 deaths the year before. Seventy-one births and 54 deaths were found to have never been reported. In this work the police spent 355 days. The Inspector of Vaccination scrutinized the registers of 145 villages, in which he found 605 births and 479 deaths entered; 183 births and 67 deaths were not reported at all nor entered in the registers. These omissions were afterwards reported.

The work of the Inspector of Vaccination shows a considerable improvement on previous years' performance, and I hope it may continue.

28. *Lakhimpur District*.—In 310 days the police visited 477 villages, with the result that out of 1,272 births and 803 deaths examined, 23 births and 7 deaths were discovered as unreported. The Vaccination Inspector looked into the registers of 64 villages, in which 174 births and 152 deaths had been recorded and found that 31 births and 24 deaths had been omitted.

The police did much about the same as in the preceding year, with much about the same results. The enquiries made by the Inspector of Vaccination would show that about 18 per cent. of births and 16 per cent. of deaths were left unreported. My opinion as to the value of the statistics collected from the five upper districts in the Brahmaputra Valley remains the same as before. The views I expressed in paragraph 24 of my report for 1901 remain unchanged.

SECTION VI.

GENERAL HISTORY OF THE CHIEF DISEASES.

29. In the annexed statement is shown the average number of deaths from each

Chief causes of mortality.

Disease.	Total number of deaths.				Ratio per mille.	
	Average for 16 years, 1884—1899.	Actual in 1900.	Actual in 1901.	Actual in 1902.	Average for 16 years, 1884—1899.	Actual in 1902.
Cholera ...	16,883	23,761	7,468	12,658	3·20	2·40
Small-pox ...	2,829	975	3,274	6,673	0·54	1·26
Fevers ...	84,265	77,557	83,696	77,679	15·97	14·72
Dysentery and diarrhoea.	15,753	14,996	11,576	11,213	2·99	2·13
Respiratory diseases ...	...	...	...	584	...	0·11
Injuries ...	1,749	1,778	1,768	1,835	0·33	0·35
All other causes ...	31,405	42,564	39,157	42,428	5·95	8·04
Total of all causes ...	152,884	161,631	146,939	153,070	28·98	29·01

of the chief diseases for the last 16 years and the actual numbers which have occurred in the three years 1900-1902, together with the average ratio per mille and the actual one for the year under report. The year 1902 was not quite so healthy as the preceding one. The total death-rate was a little higher than the average rate due to increased mortality from cholera in the Sylhet district. From a comparison of the figures for the last two years it appears that deaths from "all other causes" are increasing year by year, which shows, as remarked last year, that more care is taken in diagnosing the real cause of

deaths and not lumping all indiscriminately as due to fever or diarrhoea.

30. The marginal table shows the loss from this disease to have been little more than two-thirds of the average for the last 16 years, and this in spite of a sharp outbreak in the Sylhet district. In Sylhet there were 8,804 cases of deaths from cholera during the year 1902, against 2,805 last year, *i.e.*, an increase of 5,999 deaths. In the Sunamganj and Habiganj subdivisions a severe outbreak took place in September and lasted until the end of December. Most of the cases were in the Jagannathpur, Tahirpur, and Chhatrak circles in the Sunamganj subdivision and in the Baniachong and Nabiganj circles in the Habiganj subdivision. There was a similar outbreak in these subdivisions in 1900. Cholera is endemic in the whole of this district, though it is stated that in this instance, as in 1900, the disease was started in a village by an imported case. I suppose we shall always have these isolated outbreaks until the habits of the people change materially for the better. Until this desirable change occurs the villages will doubtless be kept no cleaner than they usually are, and they could hardly be dirtier.

District.	Population, census, 1901.	Death-rate from cholera.			
		Average for 16 years, 1884—99	Actual in 1900.	Actual in 1901.	Actual in 1902.
Surma Valley—					
Cachar ...	414,781	2·82	3·69	2·84	2·09
Sylhet ...	2,241,848	2·69	2·35	1·25	3·93
Total ...	2,656,629	2·71	2·56	1·50	3·64
Assam Valley—					
Goalpara ...	462,052	3·51	2·35	0·46	0·60
Kamrup ...	589,187	5·05	7·35	2·88	2·51
Darrang ...	337,313	3·90	9·60	1·01	0·73
Nowgong ...	261,160	5·16	24·95	0·13	0·08
Sibsagar ...	597,969	2·85	1·75	0·66	0·89
Lakhimpur ...	371,396	1·98	1·98	2·18	1·16
Total ...	2,619,077	3·71	6·47	1·33	1·14
Total for the province ...	5,275,706	3·20	4·51	1·42	2·40

divisions in 1900. Cholera is endemic in the whole of this district, though it is stated that in this instance, as in 1900, the disease was started in a village by an imported case. I suppose we shall always have these isolated outbreaks until the habits of the people change materially for the better. Until this desirable change occurs the villages will doubtless be kept no cleaner than they usually are, and they could hardly be dirtier.

31. In accordance with the wishes expressed by the Government of India in their review of the Sanitary Report of Assam for 1899, rates for cholera in tea gardens for the last two years were calculated on the tea-garden coolie population employed under the Immigration Act during the year. But the immigration year having been changed from the calendar year, to a year commencing from July and ending with June, under the Hon'ble the Chief Commissioner's Circular No. 33R., dated the 13th September 1902, the coolie population for the year 1902 is not available, the rates therefore have been based on the tea-garden population according to the census of 1901. In the Surma Valley, out of a labor population of 273,939, 467 deaths from cholera occurred, that is, a ratio of 1·70 per mille, while in the remainder of the valley the rate was 3·85. In the Brahmaputra Valley the rates for tea gardens and the rest of the valley were 1·89 and 1·01, respectively. The garden rates were everywhere higher than the general ones, except in the Sylhet district, where the mortality from this disease was four times as high as in last year. The district of Nowgong again remained phenomenally clear.

32. The marginal statement, which is furnished in accordance with the wishes of the Hon'ble the Chief Commissioner, shows, from as far back as records in my office are available, the number of deaths from cholera occurring amongst tea-garden coolies while in transit from Goalundo to the port nearest to the place of their employment. Information is not available regarding the number of immigrants into the Kamrup district during the year 1902, nor the number of deaths on steamers amongst them and amongst those who came into the district of Darrang. Last year the number of immigrants for Kamrup was 27 and the number of deaths on steamers for this and the Darrang district was 5 only. The want of this information, therefore, does not much affect the ratio of mortality which for 1902 is 0·9, against 2·6 the year before. This considerable fall in the rate of mortality shows that greater precautions are taken on the steamers and greater care exercised not to ship infected coolies.

Year.	Number of immigrants.	Number of deaths on steamers.	Number of deaths at depôts.	Total number of deaths.	Deaths per mille of immigrants.
1888 ...	30,562	150	621	771	25·2
1889 ...	36,053	90	284	374	10·4
1890 ...	24,269	2	20	22	0·9
1891 ...	31,737	19	64	83	2·6
1892 ...	34,793	48	185	233	6·7
1893 ...	33,447	3	4	7	0·2
1894 ...	30,086	31	86	117	3·9
1895 ...	34,801	89	119	208	6·0
1896 ...	42,384	282	411	693	16·4
1897 ...	66,952	371	750	1,121	16·7
1898 ...	33,762	26	58	84	2·5
1899 ...	24,449	21	51	72	2·9
1900 ...	44,534	177	351	528	11·9
1901 ...	22,242	18	40	58	2·6
1902 ...	24,344*	6†	17	23	0·9

* Information not available from Kamrup.
† Ditto ditto Kamrup and Darrang.

33. The incidence of small-pox is shown by the marginal table to have been still heavier than in either of the two

Small-pox.

District.	Population, census, 1901.	Death-rates from small-pox.			
		Average for 16 years, 1884-99.	Actual in 1900.	Actual in 1901.	Actual in 1902.
SURMA VALLEY.					
Cachar ...	414,781	0.33	0.02	0.20	2.71
Sylhet ...	2,241,848	0.39	0.24	1.13	2.34
Total ...	2,656,629	0.38	0.20	0.99	2.40
ASSAM VALLEY.					
Goalpara ...	462,052	0.96	0.03	0.46	0.27
Kamrup ...	589,187	0.90	0.15	0.09	0.15
Darrang ...	337,313	0.67	0.80	0.54	0.08
Nowgong ...	261,160	0.78	0.05	0.05	0.16
Sibsagar ...	597,969	0.45	0.05	0.11	0.03
Lakhimpur ...	371,396	0.37	0.05	0.33	0.03
Total ...	2,619,077	0.69	0.17	0.25	0.12
Total for the province ...	5,275,706	0.54	0.18	0.62	1.26

small-pox, and thereby introduce compulsory vaccination which should remain in force till the infected area is thoroughly vaccinated. Anyhow, whether vaccination can or cannot be made compulsory, the operation of inoculation could, and I think should, be made illegal, and the *Ganaks* performing it made punishable by law.

34. Malarial fevers were not nearly so prevalent in 1902, as in the previous year

Fevers.

District.			Population, census, 1901.	Death-rates from fevers.			
				Average for 16 years, 1884—99.	Actual in 1900.	Actual in 1901.	Actual in 1902.
SURMA VALLEY.							
Cachar	...	...	414,781	11.08	9.99	14.13	10.57
Sylhet	...	...	2,241,848	13.47	12.45	13.08	12.65
Total	...	...	2,656,629	13.11	12.07	13.24	12.33
ASSAM VALLEY.							
Goalpara	...	...	462,052	30.41	28.02	29.70	27.54
Kamrup	...	...	589,187	22.61	15.31	16.97	16.42
Darrang	...	...	337,313	19.23	22.86	23.89	25.71
Nowgong	...	...	261,166	28.77	22.79	19.84	16.19
Sibsagar	...	...	597,969	9.24	10.10	12.73	9.95
Lakhimpur	...	...	371,396	7.56	10.33	10.60	9.19
Total	...	...	2,619,077	19.02	17.37	18.52	17.16
Total for the province			5,275,706	15.97	14.70	15.86	14.72

the death-rate being below the average and nearly down to the level of 1900. The decrease in mortality was well marked in both valleys, though certain districts in the Brahmaputra Valley showed a rise, notably Darrang, which seems to be getting more feverish every year. I suspect this to be due to an insidious increase of *kālā-āzār*, and have invited the special attention of the District Civil Surgeon to this point; but Goalpara is still our worst district so far as malarial fevers are concerned. About four-fifths of the total number of deaths in this district are put down to fevers, the rates from 1898 to 1902 having been 84.53, 77.44, 90.30, 87.12, and 85.32 of the whole.

35. The two subjoined table have been prepared in accordance with instructions from the Chief Commissioner, and exhibit the number of cases of *kālā-āzār* and malarial fevers treated in the dispensaries of five districts, with the number of deaths registered as due to *kālā-āzār*.

TABLE NO. 1.

Showing the number of cases of *Kālā-āzār* and Malarial Fevers treated during the last nine years in dispensaries in the districts of Sylhet, Goalpara, Kamrup, Darrang, and Nowgong.

District.	1894.		1895.		1896.		1897.		1898.		1899.		1900.		1901.		1902.	
	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.	<i>Kālā-āzār</i> .	Malarial fever.
Sylhet ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1,863	46,452	2,108	40,017
Goalpara ...	19	11,093	24	11,032	11	13,074	...	12,036	...	10,792	...	8,372	...	10,744	14	13,085	4	11,979
Kamrup ...	984	7,237	801	5,494	829	8,202	7,477	9,162	143	9,363	96	8,505	47	7,441	19	9,060	22	8,662
Darrang ...	16	10,613	1,211	9,954	794	12,804	1,122	14,406	606	13,271	379	10,667	272	10,147	330	12,452	234	13,917
Nowgong ...	6,850	23,843	6,645	20,239	4,180	22,876	6,378	30,312	4,806	25,519	3,237	20,986	1,567	18,500	353	24,367	152	13,360
Total ...	7,869	52,786	8,631	46,769	5,814	56,956	8,307	65,916	5,555	58,945	3,712	48,530	1,886	46,832	2,579	105,416	2,520	87,935

36. It must not be supposed from this table that there were only a few casual cases of *kálá-ázár* in the Sylhet district prior to 1901. I saw many cases myself, both in 1899 and 1900, which I have no doubt in the world were genuine *kálá-ázár*, but it was not until an officer was deputed on special duty to visit each village in turn that the extent of prevalence of this dreaded disease was known. The officer so deputed was Senior-grade Hospital Assistant Kailas Chandra Das, and I am glad to say he has been rewarded with the title of Rai Sahib in token of the excellent work he did in this connection. *Kálá-ázár* has now practically disappeared from the Goalpara district, and there is but little in Kamrup and Nowgong. I am doubtful about Darrang, but Sylhet now causes the most anxiety, as witness the next table which is, however, very difficult to reconcile with table No. 1; as 2,108 cases treated would surely have given more than 168 deaths.

TABLE No. 2.

Statement showing the number of Deaths from *Kálá-ázár* registered during the last nine years in the districts of Sylhet, Goalpara, Kamrup, Darrang, and Nowgong.

District.	1894.	1895.	1896.	1897.	1898.	1899.	1900.	1901.	1902.
Sylhet	2	9	4	...	3	...	3	147	168
Goalpara	384	265	298	232	134	161	110	62	49
Kamrup	2,149	2,059	2,244	2,756	1,693	1,745	1,262	830	1,014
Darrang	1,992	2,477	2,471	3,597	4,113	4,101	2,979	2,446	3,391
Nowgong	8,585	11,037	10,588	12,012	10,515	8,192	4,661	2,346	1,697
Total	13,112	15,847	15,605	18,597	16,458	14,199	9,015	5,831	6,319

37. The marginal inset shows that diarrhoea and dysentery have been less prevalent

District.	Population census, 1901.	Death-rates from dysentery and diarrhoea.			
		Average for 16 years 1884— 1899.	Actual in 1900.	Actual in 1901.	Actual in 1902.
SURMA VALLEY—					
Cachar	414,781	3.86	3.57	2.68	2.59
Sylhet	2,241,818	3.10	2.45	1.80	1.96
Total	2,656,629	3.22	2.63	1.94	2.05
ASSAM VALLEY—					
Goalpara	462,052	0.71	0.47	0.29	0.19
Kamrup	589,187	1.48	1.26	0.84	1.14
Darrang	337,313	3.33	4.74	3.91	3.06
Nowgong	261,160	3.05	1.78	1.53	1.10
Sibsagar	597,969	4.16	4.55	3.90	3.32
Lakhimpur	371,396	4.64	6.11	4.72	4.55
Total	2,619,077	2.77	3.06	2.46	2.20
Total for the province ...	5,275,706	2.99	2.84	2.19	2.13

than usual in both valleys; and in all the districts of them except Kamrup, the rates for 1902 are less than those for 1901; but the same astonishing differences exist in the rates reported from different districts. The rate for Goalpara is 0.19, for Darrang 3.06, Sibsaagar 3.32 and for Lakhimpur no less than 4.55 or almost exactly 24 times as high as the Goalpara one. The table, (table No. 3), which I venture to subjoin, will give some help towards an explanation of the phenomenon.

TABLE No. 3.

Statement showing comparative incidence of Dysentery and Diarrhoea on the ordinary and tea-garden populations in Assam during the year 1902.

District.	Tea garden population, census, 1901.	Population of the rest of the district, census 1901.	Number of deaths from dysentery and diarrhoea in tea gardens.	Number of deaths from dysentery and diarrhoea in the rest of the district.	Rates per 1,000 in tea garden.	Rates per 1,000 in the rest of the district.
SURMA VALLEY.						
Cachar	129,063	285,718	558	515	4.32	1.80
Sylhet	144,876	2,096,972	516	3,868	3.56	1.84
Total	273,939	2,382,692	1,074	4,383	3.88	1.84
ASSAM VALLEY.						
Goalpara	*	462,052	6	82	...	0.18
Kamrup	5,828	583,359	13	661	2.23	1.13
Darrang	79,467	257,846	537	495	6.76	1.92
Nowgong	20,263	240,897	98	189	4.84	0.28
Sibsagar	147,532	450,437	934	1,050	6.33	2.33
Lakhimpur	130,256	241,140	1,182	509	9.07	2.11
Total	383,346	2,235,731	2,770	2,986	7.23	1.34
Grand Total	657,285	4,618,421	3,844	7,369	5.84	1.60

* No Act coolies.

That the amount of mortality from bowel diseases amongst the ordinary population is much higher in the upper part of the Brahmaputra Valley (namely, the Lakhimpur, Sibsaagar, and Darrang districts) than elsewhere, cannot be disputed; but the main

factor is evidently the proportion borne by the tea-garden coolies to the rest of the inhabitants. But two questions then arise (1) why should these three districts be so much more affected by fatal bowel disease than the rest of the province? and (2), why should the tea-garden coolies suffer so much more than the rest of the population? To these two questions, I am not as yet prepared to give a definite reply; but quote the opinions of some of my district officers. Lieutenant-Colonel Borah (Cachar) thinks the increased ratio of mortality in tea gardens is due to the inclusion by tea-garden Doctor Babus of deaths from advanced and complicated cases of *beri-beri*, etc., with deaths from diarrhœa. Captain Wood (Sylhet) says that he is unable to account for the increase, and adds—

One would have thought that these diseases would be much less prevalent in tea gardens when there are better sanitary arrangements.

In Goalpara, there are no Act-coolies and not a large number in Kamrup. Captain McNaught (Nowgong) says that as dysentery is often the immediate cause of death in chronic cases of disease, such as malarial fevers, etc., it is probable that some of the deaths really due to them are entered under the head of dysentery. Again he says—

However the probability does not account for all the difference. Dysentery and diarrhœa appear to be more prevalent on tea gardens, or of a more fatal nature than among the population of the rest of the district.

But he cannot say why this should be so.

Lieutenant-Colonel Macnamara's (Dairang) report for 1902 contains the following passage :

The number of deaths from dysentery and diarrhœa in the tea gardens during the year under review was 537, which, on a population of 79,467, works out to a death-rate of 6·76 per mille. The number of deaths from these causes on the ordinary population of 257,846 was 495 or 1·92 per mille. The death-rate from bowel complaints was therefore more than three times as heavy on gardens as among the general population. The explanation seems to me to depend on the following circumstances, *viz.*, the enforced work and exposure on gardens at all seasons, the fact that garden coolies are mostly strangers in Assam recruited from famine districts, that large bodies of them are congregated together in lines; and that treatment by febrifuges is largely practised on gardens which usually return deaths from "fever" under the head "bowel diseases", its common terminal condition. In this connection, it is interesting to compare the expenditure on quinine at Barjuli,* for instance, for 12 months (*viz.*, Rs. 3,000), with the amount realised by sale of quinine at Post Offices in whole province during the same period (Rs. 365 and annas 3 only).

Captain Leventon (Sibsagar) is inclined to think that not much reliance can be placed on the "cause of death" in village registers. He does not see any remedy; the Gaonburas are quite unable to diagnose disease

* A large group in the Darrang district employing about 10,078 coolies.

38. Major Hall (Lakhimpur), who is also the Superintendent of the Berry-White

Comparative ratios of deaths from bowel complaints and fever in the Lakhimpur district.

Rainfall.		Class.	Population according to census, 1901.	Deaths from dysentery and diarrhœa.		Deaths from fevers.		Death-rate per mile from dysentery and diarrhœa.		Death-rate per mile from fevers.	
1901.	1902.			1901.	1902.	1901.	1902.	1901.	1902.	1901.	1902.
102·73	128·03	Tea-garden population.	1,30,256	1,045	1,182	600	704	8·02	9·07	4·61	5·40
		Non tea-garden population.	2,41,140	708	502	3,336	2,978	2·94	2·11	13·83	12·35

fever amongst the tea coolies and other portions of the population of his district for the past two years; which show that while the tea-garden coolie suffers about 3 times as much from bowel complaints, he ails about 3 times as little from fevers, and the balance is a little in his favour, for the total loss from both complaints was for garden coolies 14·47 and for others 14·46 in 1902, against 12·63 and 16·77 in 1901.

39. There is so little machinery in use in Assam that the figures relating to the

Injuries and death-rate from them.

			Average for 16 years.	Actual in 1900.	Actual in 1901.	Actual in 1902.
Surma Valley	...	...	·36	·36	·37	0·33
Assam Valley	...	...	·30	·31	·30	0·32
Whole province	...	...	·33	·34	·34	0·35

few deaths which do occur from accidents might almost be reproduced as they stand from year to year without further comment, as the marginal inset shows.

40. The ratio of deaths from all other causes during 1902 is higher than ever

All other causes.

before reported, being 8·04. In 1901, it was 7·42 and for the previous 16 years the average was 5·95. This is

satisfactory as it shows that more care is being taken to diagnose the real cause of deaths and not lumping all indiscriminately as due to fever or diarrhœa.

SECTION VII.—VACCINATION.—[Published separately].

SECTION VIII.—SANITARY WORKS MILITARY.—[No remarks].

SECTION IX.

SANITARY WORKS—CIVIL.

41. My opening paragraph in this section of last year's report might be reproduced as it stands, as it portrays the exact condition of affairs.

General.

No one very large sanitary work was undertaken last year, and there is at present no provincial scheme of any importance under consideration. The incinerators at Manipur and Silchar work as well as ever. The difficulty about getting people to cultivate trenching grounds still remains as before. No one will do it; and in view of this impasse, I recommend the extension of the practice of incineration, and should be glad to see suitable furnaces put up at all large centres of population.

42. Excluding the towns of Hailakandi, Sunamganj, Karimganj, and Maulvi Bazar

Municipal expenditure on sanitary works.

which have no separate income, the aggregate actual income of the municipalities, stations, unions, and towns in Assam during the year under report was Rs 2,17,895 and the expenditure on sanitary works including these towns was Rs. 1,65,095, or 75·77 per cent. of the total income, against 80·07 per cent. last year. The expenditure on direct sanitation, which excludes Rs. 42,291 spent on roads and bridges, came to Rs. 1,17,243, or 53·81 per cent. of the total income, against 55·29 in 1901. The amounts laid out on principal sanitary works were Rs. 1,159 on vaccination, Rs. 9,597 on drainage, Rs. 27,537 on water-supply, Rs. 69,837 on conservancy, Rs. 4,604 on markets and slaughter-houses, and Rs. 9,902 on sanitary works. The small town of Mangaldai headed the list in point of expenditure on sanitary works, having spent as much as 88·67 per cent. on direct sanitation. Next in order comes the Municipality of Tezpur with a proportion of 77·60 per cent. The Habiganj and Jorhat Unions and the Gauhati and Sylhet Municipalities expended 62·41, 54·57, 57·75, and 51·71 per cent., respectively, on sanitation proper. All the other municipal bodies, except the town of North Lakhimpur, devoted more than one-third of their income to these purposes. The rate for the town of Lakhimpur was only 22·58, being the lowest proportion spent by any public body on sanitary works.

43. In accordance with the instructions contained in paragraph 18 of the Resolution by the Hon'ble the Chief Commissioner in the Sanitary

Sanitary improvements in rural areas.

Report for 1895, the following account is given of the sanitary improvements effected in the rural areas of the province during the year:

Silchar Local Board.—Two tanks were improved and five more constructed at a total cost of Rs. 630. Repairs were executed to a good number of wells and latrines.

Hailakandi Local Board.—Three tanks were dug at a total cost of Rs. 826.

North Sylhet Local Board.—The total amount spent by this Board on rural sanitation was Rs. 3,847, of which Rs. 3,178 were laid out for the improvement of water-supply, and the rest for the conservancy of towns and villages. Five tanks were constructed at places where they were most needed. All the tanks and wells of the Board which numbered 23 of each kind, were kept in a good state of repair, and watchmen were employed to see some of the tanks kept free from pollution. The latrines at Balaganj and Fenchuganj were repaired, and sweepers kept for cleaning them.

Karimganj Local Board.—The attention of the Board having been devoted to the liquidation of debts and the improvements of its condition, nothing was done towards sanitary improvement in rural areas during 1902.

South Sylhet Local Board.—An expenditure of Rs. 3,747 was incurred in excavating eight new tanks, clearing old ones, and repairing wells.

Habiganj Local Board.—The sanitary works carried out by this Board consisted in the excavation and improvement of tanks, improvement of drains, and repairing of existing tanks and wells. The total sum spent amounted to Rs. 3,562. The Habiganj Union laid out as much as half of its income on conservancy.

Sunamganj Local Board.—A sum of Rs. 1,462 was expended for the improvement of water-supply by digging two tanks, repairing and removing weeds from already existing ones, and several roads and roadside drains were repaired and constructed at a total cost of Rs. 2,000.

Dhubri Local Board.—Six *pucca* wells of 4 feet diameter each were constructed and completed on an expenditure of Rs. 2,965. A sum of Rs. 440 was spent for the up-keep of the wells constructed during the previous years. Nothing was spent by this Board on conservancy in rural areas.

Goalpara Local Board.—The total amount expended on rural sanitation was Rs. 1,760. Rs. 242 were spent for obtaining 16 stone ware-pipes and Rs. 598 for annual repairs to old wells and Goalpara drainage scheme. This Board expended nothing on conservancy in rural areas,

Gauhati Local Board.—The construction of a bund for the protection of Magurmari *hât* at a cost of Rs. 211 was the only original work of this Board. Annual repairs were executed to the existing tanks, wells, drains, and *hât*-sheds at a total cost of Rs. 2,266. It is satisfactory to note that this Board laid out more than 70 per cent. of its income on sanitation.

Barpeta Local Board.—A sum of Rs. 289 of percentage of 1·1 only of the total income of Rs. 27,096 was expended by this Board for keeping all existing *pucca* wells and tubes in proper order. The Chairman remarks :—"The damages done by the earthquake and annual floods have not yet been fully restored to order for want of sufficient funds, but it is hoped that they will be put in order gradually as funds permit."

Tezpur Local Board.—An outlay of Rs. 2,370 was incurred for the improvement of water-supply. Repairs were executed to all the existing wells, and a *pucca* well was constructed at Amaribari. Cutting and clearing of drains cost Rs. 544, and Rs. 1,403 were required for construction and repair of *hât*-sheds and maintenance of the conservancy establishment to sweep and keep clean all *hât* sites.

Mangaldai Local Board.—Two wells were constructed, some tanks were improved, and annual repairs were done to some others; but the total spent has not been reported.

Nowgong Local Board.—This Board spent only Rs. 185 for clearing and repairing the existing *pucca* wells, numbering 33. The Chairman remarks :—"Owing to scarcity of funds the Board did not undertake any original work."

Sibsagar Local Board.—The expenditure on original works was Rs. 1,758. Some tanks were cleared and repairs executed to 5 *hâts* and 32 tanks at a cost of Rs. 1,310.

Jorhat Local Board.—A sum of Rs. 1,932 was laid out in deepening a tank, constructing a *pucca* well and repairing 15 wells and 25 tanks. Repair and construction of *bunds* and *hâts* required Rs. 1,938. This Board expended only 3 per cent. of its total income on conservancy in rural areas. The Jorhat Union laid out only 15 per cent. of its income for this purpose.

Golaghat Local Board.—The total amount expended on rural sanitation was Rs. 2,207, with which 5 new tanks were completed and 34 existing tanks were repaired. The expenditure on conservancy was little more than 2 per cent. of the income.

Dibrugarh Local Board.—The construction of the platform of Rowmari *pucca* well was completed at a cost of Rs. 135. 22 wells were repaired and Rs. 106 were expended on drainage. Repairs to *Sessa bund* entailed a cost of Rs. 200.

North Lakhimpur Local Board.—Four *pucca* wells and 2 *pucca* platforms were constructed at a total outlay of Rs. 2,071 and repairs to two ring and two *pucca* wells were done with an amount of Rs. 498. The amount spent on conservancy in towns was very small, being only 3 per cent. of the total income of the Town Fund.

44. The following particulars are taken from the remarks recorded by the District Medical Officers on the progress made in the maintenance of the village sanitary inspection books in their districts. Attention is again invited to the continued neglect shown in the Kamrup and Darrang districts, with regard to the submission of these books.

Cachar.—There are only three selected villages in which the system of maintenance of the village sanitary records has been introduced, but there are no sanitary matters of any importance worth noticing in connection with them.

Sylhet.—Thirty-two persons were required to maintain village sanitary inspection books. Six copies of the same were received quarterly from six Hospital Assistants. No such reports were received from any non-official gentlemen. The Civil Surgeon reiterates the remarks made last year that these books are useless and of no practical value.

Goalpara.—The village sanitary inspection books are maintained in 11 villages of this district. Eight books were submitted four times and the rest thrice during the year. This is quite the best record in Assam.

Kamrup.—Out of the 14 selected villages in which these books are kept, 2 submitted them four times, one thrice, 4 twice, and the rest did not send them at all for inspection. I do not consider them of sufficient value to trouble about, unless more punctual submission can be ensured.

Darrang.—The village sanitary inspection books were not regularly submitted. Only six books were received from the Mangaldai subdivision and none from the Tezpur. One person submitted his report four times and two once only.

Nowgong.—Three, seven, four, and seven books were submitted in the 1st, 2nd, 3rd, and 4th quarters, respectively, out of sixteen which should have come in regularly.

Sibsagar.—There are 2 selected villages in the Sibsaagar, 3 in the Jorhat, and 2 in the Golaghat subdivision, in which such books are maintained. Most of them were regularly submitted during the year.

Lakhimpur.—All the village sanitary inspection books were submitted regularly to the Civil Surgeon's office for inspection, and the question naturally arises why cannot other villages be made to do the same.

SECTION X.

GENERAL REMARKS.

45. The sale of quinine has decreased all over the province, - probably because the year was less malarious than usual: In the Surma

Sale of quinine.

Valley the total number of packages sold was 707 against 811 in 1901; in the Assam Valley 265 packages were distributed to the various agencies for sale against 405 in the previous year. In the Khasi and Jaintia Hills also the number of packages disposed of fell from 501 in 1901 to 462 in 1902; in the whole province, therefore, the sale decreased by 283 packages.

46. As stated in last year's report, an American fruit drying machine has been purchased, and is being experimentally worked at the

Drying machine.

Gauhati jail. The results seem so satisfactory that I have advised the purchase of one more for the Gauhati jail and three for the jail at Sylhet and one for the Asylum at Tezpur. The vegetables chiefly used for drying were cabbage, turnips, carrots, beans, etc., and it was not found necessary to remove the dried vegetables from the tins in which they were stored for redrying or spreading them in the sun. Four seers of dried vegetables can be turned out after nine hours' work, and this quantity is sufficient for the daily consumption of 160 prisoners, and represents 30 seers of fresh vegetables. The machine will therefore provide sufficient dried English vegetables extremely palatable when cooked, and retaining a large portion of the flavour of the fresh vegetables, to supplement and vary, though not replace, the ordinary country vegetables of the pumpkin class during the rains.

47. A mosquito brigade was organized by Captain Willmore, I.M.S., at Kohima, the expense of which was covered by private subscriptions

Mosquito brigades.

assisted by a monthly donation from the "Town Improvement Fund." The brigade commenced operations on the 17th March 1902, and was in good working order by the beginning of April. The operations were continued up to the end of November. The result was that the number of mosquitos in the station and admissions into hospitals for ague very greatly diminished. Efforts are being made to inaugurate similar brigades in other places, where funds and local conditions will permit of a trial being given.

48. The sanitary arrangements of eight coolie camps on the Assam-Bengal

Railway camps.

Railway in the North Cachar Hills and one at Lumding in Nowgong, which consisted of over 200 persons, were inspected by the District Civil Surgeons. The population of railway camps is always fluctuating, but when such camps had a strength of more than 200 souls, the Civil Surgeons concerned inspected them and reported on the medical and sanitary arrangements, which were on the whole satisfactory. The recommendations that were made by our Civil Surgeons from time to time received the attention of the Railway authorities, and no instances of friction were brought to notice. In the camps situated within the jurisdiction of the Cachar district, the source of water-supply is generally local rivers, the water of which the Civil Surgeon considers is of good quality and suitable for drinking purpose. The system of trenching is also in force. The report made by the Civil Medical Officer, Nowgong, on the Lumding camp shows that stagnant water accumulates in the excavations made by coolies for earth required for bricks and, that mosquitos naturally abound in such places. I have lately, with the approval of the Hon'ble the Chief Commissioner, issued instructions to District Civil Surgeons regarding the inspection of coolie camps. The construction of a new railway line called the "Dwara-Tharia Line" has been commenced, and all the camps consisting of over 200 coolies have recently been inspected by the Civil Surgeon of Khasi and Jaintia Hills. The sanitary arrangements of those camps are on the whole as satisfactory as can be expected. The Eastern Bengal State Railway have also started an extension from Dhubri to Gauhati and the question of suitable sanitary inspection and administration of their works is at present under consideration.

49. The Sanitary Board held two meetings during the year, notes being exchanged at other times as requisite.

Sanitary Board.

50. In conclusion, I desire to bear witness to the good work done by my head clerk, Babu Ram Chandra Datta, and my other clerks, and to thank them for the care and trouble taken in compiling the tables and figured statements attached to this report.

C. W. CARR-CALTHROP, M.D., Ch.D., Colonel, I.M.S.,

Principal Medical Officer and Sanitary Commissioner, Assam.

INDEX TO STATEMENTS.

IMPERIAL.

- STATEMENT NO. I.—Showing the births registered in the province of Assam during the year 1902.
- STATEMENT NO. II.—Showing the births and deaths in the province of Assam during the year 1902.
- STATEMENT NO. III.—Deaths registered in the province of Assam during each month of the year 1902.
- STATEMENT NO. IV.—Deaths registered according to age in the province of Assam during the year 1902.
- STATEMENT NO. V.—Deaths registered according to classes in the province of Assam during the year 1902.
- STATEMENT NO. VI.—Deaths registered from different causes in the districts and towns of the province of Assam during the year 1902.
- STATEMENT NO. VII.—Deaths registered from cholera in the province of Assam during each month of the year 1902.
- STATEMENT NO. VIII.—Deaths registered from small-pox in the province of Assam during each month of the year 1902.
- STATEMENT NO. IX.—Deaths registered from fevers in the province of Assam during each month of the year 1902.
- STATEMENT NO. X.—Deaths registered from dysentery and diarrhœa in the province of Assam during each month of the year 1902.

STATEMENTS.

Annual Form No. I.—Statement showing the Births registered

1	2	3			4		
No.	Districts.	Population according to the census of 1901.			Number of births registered.		
		Male.	Female.	Total.	Male.	Female.	Total.
	SURMA VALLEY.						
1	Cachar	216,806	197,975	414,781	7,441	7,318	14,759
2	Sylhet	1,141,060	1,100,788	2,241,848	42,749	40,534	83,283
	Total	1,357,866	1,298,763	2,656,629	50,190	47,852	98,042
	BRAHMAPUTRA VALLEY.						
3	Goalpara	242,685	219,376	462,052	10,926	9,972	20,898
4	Kamrup	292,869	296,318	589,187	9,722	8,961	18,683
5	Darrang	176,030	161,283	337,313	5,828	5,484	11,312
6	Nowgong	132,995	128,165	261,160	3,825	3,408	7,233
7	Sibsagar	316,985	280,984	597,969	7,617	7,009	14,626
8	Lakhimpur	199,359	172,037	371,396	5,038	4,643	9,681
	Total	1,360,923	1,258,154	2,619,077	42,956	39,477	82,433
	Total for the Province ...	2,718,789	2,556,917	5,275,706	93,146	87,329	180,475

Annual Form No. II.—Statement showing the Births and

1	2			3	4	5			6		7		
No.	District.			Area, in square miles.	Average population per square mile.	Population, census (1901).			Births.		Number of deaths registered.		
						Male.	Female.	Total.	Total number.	Birth-rate per 1,000 of population.	Male.	Female.	Total.
	SURMA VALLEY.												
1	Cachar	...	...	2,063	201	216,806	197,975	441,781	14,759	35.58	6,166	5,800	11,966
2	Sylhet	...	...	5,443	412	1,141,060	1,100,788	2,241,848	83,283	37.15	39,594	36,355	75,949
	Total	...	...	7,506	354	1,357,866	1,298,763	2,656,629	98,042	36.90	45,760	42,155	87,915
	BRAHMAPUTRA VALLEY.												
3	Goalpara	...	...	3,961	117	242,685	219,367	462,052	20,898	45.23	7,843	7,071	14,914
4	Kamrup	...	...	3,858	153	292,869	296,318	589,187	18,683	31.71	7,166	6,380	13,546
5	Darrang	...	...	3,418	99	176,030	161,283	337,313	11,312	33.54	6,342	5,707	12,049
6	Nowgong	...	...	3,843	68	132,995	128,165	261,160	7,233	27.70	3,008	2,567	5,575
7	Sibsagar	...	...	4,996	122	316,985	280,984	597,969	14,626	24.46	5,637	5,211	10,848
8	Lakhimpur	...	...	4,207	88	199,359	172,037	371,396	9,681	26.07	4,342	3,881	8,223
	Total	...	...	24,283	108	1,360,923	1,258,154	2,619,077	82,433	31.48	34,338	30,817	65,155
	Total for the Province ...			31,789	166	2,718,789	2,556,917	5,275,706	180,475	34.21	80,098	72,972	153,070*

* Those born dead are not included in

in the Province of Assam during the year 1902.

5			6	7	8	9		
Ratio of births per 1,000 of population.			Number of males born to every 100 females born.	Excess of births over deaths per 1,000 of population.	Excess of deaths over births per 1,000 of population.	Mean ratio of births per 1,000 during previous five years.		
Male.	Female.	Total.				Male.	Female.	Total.
17'94	17'64	35'58	101'68	6'73	...	16'28	15'51	31'79
19'07	18'08	37'15	105'46	3'27	...	18'18	17'00	35'18
18'89	18'01	36'90	104'89	3'81	...	17'89	16'77	34'66
23'65	21'58	45'23	109'57	12'95	...	21'30	20'20	41'50
16'50	15'21	31'71	108'49	8'72	...	15'61	14'46	30'07
17'28	16'26	33'54	106'27	...	2'18	15'23	14'25	29'48
14'65	13'05	27'70	112'24	6'35	...	14'41	13'29	27'70
12'74	11'72	24'46	108'67	6'32	...	12'72	11'51	24'23
13'57	12'50	26'07	108'57	3'93	...	13'03	11'95	24'98
16'41	15'07	31'48	108'56	6'60	...	15'42	14'30	29'72
17'66	16'55	34'21	106'66	5'20	...	16'66	15'55	32'21

Deaths in the Province of Assam during the year 1902.

8	9											10		
Number of deaths of males to every 100 deaths of females.	Deaths per 1,000 of population from—											Mean ratio of deaths per 1,000 during previous five years.		
	Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	All causes.			Male.	Female.	Total.
									Male.	Female.	Total.			
106'31	2'09	2'71	...	10'57	2'59	0'37	0'34	10'18	28'39	29'30	28'85	32'93	31'90	32'44
108'91	3'93	2'34	...	12'65	1'95	0'09	0'39	12'53	34'70	33'03	33'88	36'62	34'18	35'42
108'55	3'64	2'40	...	12'33	2'05	0'13	0'38	12'16	33'70	32'46	33'09	36'03	33'83	34'95
110'92	0'60	0'27	...	27'54	0'19	...	0'35	3'33	32'32	32'23	32'28	38'75	38'97	38'85
112'32	2'51	0'15	...	16'42	1'14	...	0'34	2'43	24'47	21'53	22'99	33'13	28'60	30'84
111'13	0'73	0'08	...	25'71	3'06	...	0'39	5'75	36'03	35'39	35'72	41'75	38'70	40'29
117'18	0'08	0'16	...	16'19	1'10	0'03	0'34	3'45	22'62	20'01	21'35	54'14	45'04	49'67
108'18	0'89	0'03	...	9'95	3'32	0'38	0'25	3'32	17'78	18'55	18'14	23'42	23'63	23'52
111'88	1'16	0'03	...	9'91	4'55	...	0'26	6'23	21'78	22'56	22'14	24'72	25'06	24'88
111'43	1'14	0'12	...	17'16	2'20	0'08	0'32	3'86	25'23	24'49	24'88	33'81	31'78	32'83
109'77	2'40	1'26	...	14'72	2'13	0'11	0'35	8'04	29'46	28'54	29'01	34'92	32'82	33'90

this or any of the other statements.

Annual Form No. III.—Deaths registered in the Province

1	2								
No.	District.				January.	February.	March.	April.	May.
	SURMA VALLEY.								
1	Cachar	...	...	...	851	709	810	1,121	1,275
2	Sylhet	...	...	...	6,537	5,704	5,921	5,991	6,281
	Total	...	...	...	7,388	6,413	6,731	7,112	7,556
	BRAHMAPUTRA VALLEY.								
3	Goalpara	...	...	...	1,181	952	973	1,325	1,340
4	Kamrup	...	...	...	829	770	841	1,187	1,449
5	Darrang	...	...	...	928	797	837	979	1,270
6	Nowgong	...	...	...	452	439	393	490	569
7	Sibsagar	...	...	...	917	773	755	825	827
8	Lakhimpur	...	...	...	679	466	539	617	630
	Total	...	...	...	4,986	4,197	4,338	5,423	6,085
	Total for the Province	...	...	...	12,374	10,610	11,069	12,535	13,641
	Ratio of deaths per month	...	1,000	in each month	2'34	2'01	2'10	2'38	2'59

Annual Form No. IV.—Deaths registered according to Age

1	2			3		4		5		6	
No.	District.			Under 1 year.		1 year and under 5.		5 and under 10.		10 and under 15.	
				Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
	SURMA VALLEY.										
1	Cachar	...	...	1,579	1,525	730	741	463	370	333	264
2	Sylhet	...	...	10,613	9,694	4,865	5,292	3,122	2,346	2,194	1,528
	Total	...	...	12,192	11,219	15,595	6,033	3,585	2,716	2,527	1,792
	BRAHMAPUTRA VALLEY.										
3	Goalpara	...	...	2,594	2,373	992	1,030	426	396	221	189
4	Kamrup	...	...	1,429	1,325	1,048	1,098	655	532	464	281
5	Darrang	...	...	1,115	1,071	867	825	418	359	344	209
6	Nowgong	...	...	477	429	429	390	281	221	277	190
7	Sibsagar	...	...	820	679	773	696	401	347	293	208
8	Lakhimpur	...	...	517	466	612	619	251	200	173	134
	Total	...	...	6,952	6,343	4,721	4,658	2,432	2,055	1,772	1,211
	Total for the Province	...	...	19,144	17,562	10,316	10,691	6,017	4,771	4,299	3,003
	Ratio per 1,000 living	...	...	198.53	179.61	35.75	35.24	14.45	11.70	13.81	12.15

of Assam during each month of the year 1902.

3							4
June.	July.	August.	September.	October.	November.	December.	Total deaths registered during the year.
1,148 4,890	1,108 4,698	917 4,703	839 6,391	873 8,718	1,030 8,079	1,285 8,036	11,966 75,949
6,038	5,806	5,620	7,230	9,591	9,109	9,321	87,915
1,405 1,049 1,098 379 946 597	1,333 1,110 1,058 441 810 747	877 1,176 1,011 376 900 864	1,215 1,164 993 402 1,016 733	1,305 1,375 1,101 472 1,076 883	1,338 1,488 1,046 459 1,119 803	1,670 1,108 931 703 884 665	14,914 13,546 12,049 5,575 10,848 8,223
5,474	5,499	5,204	5,523	6,212	6,253	5,961	65,155
11,512	11,305	10,824	12,753	15,803	15,362	15,282	1,53,070
2.18	2.14	2.05	2.42	2.99	2.91	2.90	29.01

in the Province of Assam during the year 1902.

7		8		9		10		11		12	
15 and under 20.		20 and under 30.		30 and under 40.		40 and under 50.		50 and under 60.		60 and upwards.	
Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.	Male.	Female.
260 2,223	447 3,176	655 4,152	977 5,207	798 3,973	557 2,956	516 2,517	305 1,519	309 1,966	257 1,396	523 3,969	357 3,241
2,483	3,623	4,807	6,184	4,771	3,513	3,033	1,824	2,275	1,653	4,492	3,598
240 348 268 185 242 155	359 334 344 183 303 268	653 675 776 359 622 762	757 821 935 354 978 1,053	730 770 999 371 841 888	540 607 799 298 770 576	638 702 735 276 687 480	352 521 539 192 507 292	561 626 540 218 570 332	414 485 429 186 397 162	788 449 280 135 388 172	661 376 197 124 326 111
1,438	1,791	3,847	4,898	4,599	3,590	3,518	2,403	2,847	2,073	2,212	1,795
3,921	5,414	8,654	11,082	9,370	7,103	6,551	4,227	5,122	3,726	6,704	5,393
19.25	24.11	18.43	21.63	21.53	20.60	25.49	21.02	36.71	31.36	66.15	54.29

Annual Form No. V.—Deaths registered according to Classes

1	2				3				
No.	District.				Population according to census of 1901.				
					Muhammad-ans.	Hindus.	Christians.	Other classes.	Total.
	SURMA VALLEY.								
1	Cachar	...	...	...	126,698	278,964	957	8,162	414,781
2	Sylhet	...	...	...	1,180,324	1,049,248	744	11,532	2,241,848
	Total	...	...	...	1,307,022	1,328,212	1,701	19,694	2,656,629
	BRAHMAPUTRA VALLEY.								
3	Goalpara	...	...	...	128,388	203,696	3,495	126,473	462,052
4	Kamrup	...	...	...	53,701	407,363	1,479	120,644	589,187
5	Darrang	...	...	...	17,372	239,318	1,358	79,265	337,313
6	Nowgong	...	...	...	12,578	167,709	593	80,280	261,160
7	Sibsagar	...	...	...	24,878	529,480	2,489	41,122	597,969
8	Lakhimpur	...	...	...	11,925	333,484	3,112	22,875	371,396
	Total	...	...	...	248,842	1,881,050	12,526	476,659	2,619,077
	Total for the Province	...	...	...	1,555,864	3,209,262	14,227	496,353	5,275,706

Annual Form No. VI.—Deaths registered from different Causes in the

1	2			3	4	5	6	7	8	9	10	11
No.	District and town.			Population according to census of 1901.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	In	
											Suicide.	
											Male.	Female.
	A.—DISTRICTS.											
	SURMA VALLEY.											
1	Cachar	...	...	404,187	852	1,123	...	4,317	1,037	154	8	2
2	Sylhet	...	...	2,211,016	8,740	5,206	...	28,003	4,322	178	20	19
	Total	...	...	2,615,203	9,592	6,329	...	32,320	5,359	332	28	21
	BRAHMAPUTRA VALLEY.											
3	Goalpara	...	...	452,028	267	121	...	12,587	73	...	...	3
4	Kamrup	...	...	566,710	1,330	84	...	9,260	543	...	24	23
5	Darrang	...	...	331,555	239	26	...	8,571	1,009	...	12	6
6	Nowgong	...	...	256,730	21	43	...	4,165	262	7	5	2
7	Sibsagar	...	...	586,999	535	14	...	5,802	1,932	225	8	1
8	Lakhimpur	...	...	358,671	403	9	...	3,524	1,621	...	19	2
	Total	...	...	2,552,693	2,795	297	...	43,909	5,440	232	68	37
	Total of Districts carried over	...	...	5,167,896	12,387	6,626	...	76,229	10,799	564	96	58

in the Province of Assam during the year 1902.

4					5				
Number of deaths registered.					Ratio of deaths per 1,000 of population.				
Muhammad-ans.	Hindus.	Christians.	Other classes.	Total.	Muhammad-ans.	Hindus.	Christians.	Other classes.	Total.
4,650	5,516	8	1,692	11,966	36.70	20.13	8.36	207.39	28.85
43,442	31,158	16	1,333	75,949	36.81	29.70	21.51	115.59	33.88
48,092	36,774	24	3,025	87,915	36.79	27.68	14.11	153.60	33.09
3,823	5,771	49	5,271	14,914	29.78	28.33	14.02	41.68	32.28
998	9,218	28	3,302	13,546	18.58	22.63	18.90	26.07	22.99
534	5,730	45	5,740	12,049	30.74	23.94	33.14	72.42	35.72
256	3,249	15	2,035	5,575	20.35	19.37	25.30	25.60	21.35
434	8,556	14	1,844	10,848	17.45	16.16	5.62	44.84	18.14
206	6,995	26	996	8,223	17.27	20.98	8.35	43.54	22.14
6,251	39,519	177	19,208	65,155	25.12	21.09	14.13	40.30	24.88
54,343	76,293	201	22,233	1,53,070	34.93	23.77	14.13	44.79	29.61

Districts and Towns of the Province of Assam during the year 1902.

12			13	14	15									
Injuries.			All other causes.	Total deaths from all causes.	Ratio of deaths per 1,000 of population.									
Wounding or accident.	Snake-bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.	
													For the year.	Mean of previous five years.
110	13	133	4,144	11,760	2.11	2.78	...	10.68	2.57	0.38	0.33	10.25	29.10	32.40
719	96	854	27,837	75,140	3.95	2.35	...	12.67	1.95	0.08	0.39	12.59	33.98	35.37
829	109	987	31,981	86,900	3.66	2.42	...	12.35	2.06	0.13	0.38	12.23	33.23	34.91
110	43	156	1,473	14,677	0.59	0.27	...	27.85	0.16	...	0.34	3.26	32.47	38.68
104	46	197	1,326	12,740	2.34	0.15	...	16.34	0.96	...	0.35	2.34	22.48	30.36
73	33	124	1,865	11,834	0.72	0.08	...	25.85	3.04	...	0.37	5.63	35.69	40.02
60	19	86	864	5,448	0.08	0.17	...	16.22	1.02	0.03	0.34	3.36	21.22	49.79
122	17	148	1,901	10,557	0.91	0.02	...	9.89	3.29	0.38	0.25	3.24	17.98	23.28
60	6	87	2,195	7,839	1.12	0.03	...	9.83	4.52	...	0.24	6.12	21.86	24.45
529	164	798	9,624	63,095	1.09	0.12	...	17.21	2.13	0.09	0.31	3.77	24.72	32.58
1,358	273	1,785	41,605	149,995	2.40	1.28	...	14.75	2.09	0.11	0.35	8.05	29.03	33.58

Annual Form No. VI.—Deaths registered from different Causes in the

1	2	3	4	5	6	7	8	9	In	
No.	District and town.	Population according to census of 1901.	Cholera.	Small-pox.	Plague.	Fever.	Dysentery and diarrhoea.	Respiratory diseases.	Suicide.	
									Male.	Female.
	Brought forward	5,167,896	12,387	6,626	...	76,229	10,799	564	96	58
	B.—TOWNS. SURMA VALLEY.									
1	Silchar, district Cachar	9,256	8	1	...	55	32	...	1	...
2	Hailakandi, " "	1,338	4	1	...	11	4	...	...	...
3	Sylhet, " Sylhet	13,893	19	12	...	226	25	18	...	...
4	Karimganj, " "	5,692	10	23	...	52	26	...	2	...
5	Maulvi Bazar, " "	2,481	22	...	...	20	5	...	...	...
6	Habiganj, " "	5,236	7	2	...	41	5	...	...	...
7	Sunamganj, " "	3,530	6	1	...	23	1	...	...	...
	Total	41,426	76	40	...	428	98	18	3	...
	BRAHMAPUTRA VALLEY.									
8	Dhubri district Goalpara,	3,737	7	2	...	32	9	...	...	...
9	Goalpara, " "	6,287	4	...	...	105	6	...	...	...
10	Gauhati, " Kamrup	11,661	75	1	...	233	41	...	1	...
11	Barpeta, " "	10,816	73	1	...	181	90	...	...	...
12	Tezpur, " Darrang	5,047	6	...	...	85	23	...	...	2
13	Mangaldai, " "	711	3	...	...	15	...	...	...	...
14	Nowgong, " Nowgong	4,430	...	...	...	63	25	...	...	...
15	Sibsagar, " Sibsagar	5,712	...	1	...	64	12	2	...	...
16	Jorhat, " "	2,899	...	...	...	23	19	...	...	...
17	Golaghat, " "	2,359	...	1	...	63	21	...	...	...
18	Dibrugarh, " Lakhimpur	11,227	27	1	...	116	55	...	1	...
19	North Lakhimpur, district "	1,498	...	...	...	42	15	...	...	...
	Total	66,384	195	7	...	1,022	316	2	2	2
	Total of Towns	107,810	271	47	...	1,450	414	20	5	2
	Total for the Province	5,275,706	12,658	6,673	...	77,679*	11,213	584	101	60

* Includes 6,333 deaths

† Includes 2,263 deaths from anæmia and anchylostomiasis

Annual Form No. VII.—Deaths registered from Cholera

1	2				3		4							
No.	District.				Circles of regis- tration.		Villages.		January.	February.	March.	April.	May.	
					Number in each dis- trict.	Number from which deaths from cholera were reported.	Number in each dis- trict.	Number from which deaths from cholera were reported.						
	SURMA VALLEY.													
1	Cachar	...	...	...	8	8	379	134	4	10	42	148	172
2	Sylhet	...	...	...	21	20	8,765	1,117	495	408	333	765	354
	Total	...	...	...	29	28	9,144	1,251	499	418	375	913	526
	BRAHMAPUTRA VALLEY.													
3	Goalpara	...	...	...	14	12	1,461	48	101	4	9	80	77
4	Kamrup	...	...	...	9	8	1,716	184	6	13	42	289	167
5	Darrang	...	...	...	12	9	1,275	51	6	...	11	50	81
6	Nowgong	...	...	...	7	3	1,117	7	...	...	13	1	2
7	Sibsagar	...	...	...	12	5	1,124	89	13	7	12	38	44
8	Lakhimpur	...	...	...	6	5	1,123	187	85	4	18	30	49
	Total	...	...	...	60	42	7,816	566	211	28	105	488	420
	Total for the Province				...	89	70	16,960	1,817	710	446	480	1,401	946

Districts and Towns of the Province of Assam during the year 1902—concluded.

10			11	12	13									
Injuries.			All other causes.	Total deaths from all causes.	Ratio of deaths per 1,000 of population.									
Wounding or accident.	Snake-bite or killed by wild beasts.	Total.			Cholera.	Small-pox.	Plague.	Fevers.	Dysentery and diarrhoea.	Respiratory diseases.	Injuries.	All other causes.	From all causes.	
													For the year.	Mean of previous five years.
1,358	273	1,785	41,605	1,49,995	2'40	1'28	...	14'75	2'09	0'11	0'35	8'05	29'03	33'58
4	...	5	76	177	0'86	0'11	...	5'94	3'46	...	0'54	8'21	19'12	35'22
1	...	1	8	29	2'99	0'75	...	8'22	2'99	...	0'75	5'98	21'68	25'41
7	...	7	77	384	1'37	0'86	...	16'27	1'80	1'30	0'50	5'54	27'64	51'25
1	...	3	65	179	1'76	4'04	...	9'14	4'56	...	0'53	11'42	31'45	36'19
...	...	...	17	64	8'87	...	...	8'06	2'02	...	...	6'85	25'80	20'56
1	...	1	70	126	1'34	0'38	...	7'83	0'95	...	0'19	13'37	24'06	23'68
2	...	2	23	56	1'70	0'28	...	6'52	0'28	...	0'56	6'52	15'86	32'01
16	...	19	336	1,015	1'83	0'97	...	10'33	2'37	0'43	0'46	8'11	24'50	37'80
3	1	4	40	94	1'87	0'54	...	8'56	2'41	...	1'07	10'70	25'15	68'50
3	...	3	25	143	0'64	...	...	16'70	0'95	...	0'48	3'98	22'75	33'72
...	...	1	82	433	6'43	0'09	...	19'98	3'51	...	0'09	7'03	37'13	39'10
2	...	2	26	373	6'75	0'09	...	16'73	8'32	...	0'19	2'40	34'48	46'69
3	1	6	74	194	1'19	...	...	16'84	4'56	...	1'19	14'66	38'44	56'87
...	1	1	2	21	4'22	...	...	21'10	...	...	1'41	2'81	29'54	47'82
2	...	2	37	127	...	...	...	14'22	5'65	...	0'45	8'35	28'67	42'66
2	...	2	39	120	...	0'18	..	11'20	2'10	0'35	0'35	6'83	21'01	24'33
...	...	...	24	66	...	...	...	7'94	6'55	...	...	8'28	22'77	37'25
1	...	1	19	105	...	0'42	...	26'71	8'90	...	0'43	8'05	44'51	65'28
7	...	8	107	314	2'41	0'09	...	10'33	4'90	...	0'71	9'53	27'97	36'07
1	...	1	12	70	...	...	...	28'04	10'01	...	0'67	8'01	46'73	42'72
24	3	31	487	2,060	2'93	0'10	...	15'40	4'76	0'03	0'47	7'34	31'03	42'31
40	3	50	823	3,075	2'51	0'44	...	13'45	3'84	0'19	0'46	7'63	28'52	40'58
1,398	276	1,835	42,428†	1,53,070	2'40	1'26	...	14'72	2'13	0'11	0'35	8'04	29'01	33'90

from *kald-dzdr*,
and 61 deaths from measles and chicken-pox.

in the Province of Assam during each month of the year 1902.

5							6			7			8
June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.
							Male.	Female.	Total.	Male.	Female.	Total.	
65	21	10	19	19	143	211	478	386	864	2'20	1'95	2'09	2'99
120	40	102	1,093	2,226	1,370	1,498	4,348	4,456	8,804	3'81	4'05	3'93	2'11
185	61	112	1,112	2,245	1,513	1,709	4,826	4,842	9,668	3'55	3'73	3'64	2'25
2	1	..	1	...	1	2	136	142	278	0'56	0'65	0'60	3'94
54	148	263	88	120	174	114	749	729	1,478	2'56	2'46	2'51	6'99
52	16	11	7	7	7	...	122	126	248	0'69	0'78	0'73	3'44
1	...	...	...	2	2	...	7	14	21	0'06	0'11	0'08	5'88
61	36	26	74	32	111	81	280	255	535	0'88	0'91	0'89	2'39
40	46	56	54	28	18	2	208	222	430	1'04	1'29	1'16	1'68
210	247	356	224	189	313	199	1,502	1,488	2,990	1'10	1'18	1'14	4'12
395	308	468	1,336	2,434	1,826	1,908	6,328	6,330	12,658	2'34	2'48	2'40	3'18

Annual Form No. VIII.—Deaths registered from Small-pox in

1	2	3	4							
No.	District.	Circles of registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from small-pox were reported.	Number in each district.	Number from which deaths from small-pox were reported.					
	SURMA VALLEY.									
1	Cachar	8	7	379	187	41	73	108	143	153
2	Sylhet	21	18	8,765	1,364	601	707	1,074	958	858
	Total	29	25	9,144	1,551	642	780	1,182	1,101	1,011
	BRAHMAPUTRA VALLEY.									
3	Goalpara	14	7	1,461	18	27	20	19	11	21
4	Kamrup	9	6	1,716	22	2	2	1	8	44
5	Darrang	12	8	1,275	15	4	1	4	6	1
6	Nowgong	7	3	1,117	13	...	2	4	...	10
7	Sibsagar	12	6	1,124	15	...	1	...	4	1
8	Lakhimpur	6	4	1,123	6	...	1	...	...	...
	Total	60	34	7,816	89	33	27	28	29	77
	Total for the Province ...	89	59	16,960	1,640	675	807	1,210	1,130	1,088

Annual Form No. IX.—Deaths registered from Fevers in the

1	2	3	4								
No.	District.	Circles of registration.		Villages.							
		Number in each district.	Number from which deaths from fevers were reported.	Number in each district.	Number from which deaths from fevers were reported.						
	SURMA VALLEY.										
1	Cachar	8	8	379	281	327	248	292	412	476	
2	Sylhet	21	21	8,765	5,998	2,383	2,111	2,198	2,016	2,593	
	Total	29	29	9,144	6,279	2,710	2,359	2,490	2,428	3,069	
	BRAHMAPUTRA VALLEY.										
3	Goalpara	14	14	1,461	1,461	953	806	815	1,080	1,084	
4	Kamrup	9	9	1,716	1,383	682	623	676	754	1,007	
5	Darrang	12	12	1,275	1,009	709	593	588	728	949	
6	Nowgong	7	7	1,117	695	345	328	304	397	428	
7	Sibsagar	12	11	1,124	745	501	490	470	466	466	
8	Lakhimpur	6	6	1,123	703	312	205	247	320	291	
	Total	60	59	7,816	5,996	3,502	3,045	3,100	3,745	4,225	
	Total for the Province ...	89	88	16,960	12,275	6,212	5,404	5,590	6,173	7,294	

the Province of Assam during each month of the year 1902.

5							6			7		8			9
June.	July.	August.	September.	October.	November.	December.	Total.			Number of these deaths among children.		Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 of previous five years.
							Male.	Female.	Total.	Under 1 year.	1 to 10 years.	Male.	Female.	Total.	
127 419	109 216	103 144	72 73	42 48	40 50	114 96	577 2,714	548 2,530	1,125 5,244	279 1,212	456 2,471	2.66 2.38	2.77 2.30	2.71 2.34	0.06 0.38
546	325	247	145	90	90	210	3,291	3,078	6,369	1,491	2,927	2.42	2.37	2.40	0.33
16 ... 2 3 3 1	7 2 ... 3	2 4 2 ... ... ...	... 11 5 6 4 4	... 3 2	... ... 1 7 3 2	... 9 ... 8 ... 2	64 13 9 24 6 2	59 73 17 19 10 8	123 86 26 43 16 10	15 4 5 12 4 3	23 9 11 14 3 3	0.26 0.04 0.05 0.18 0.02 0.01	0.27 0.25 0.11 0.15 0.04 0.05	0.27 0.15 0.08 0.16 0.03 0.03	0.23 0.72 1.43 2.47 0.96 0.41
25	12	8	30	5	13	17	118	186	304	43	63	0.09	0.15	0.12	0.91
571	337	255	175	95	103	227	3,409	3,264	6,673	1,534	2,990	1.25	1.28	1.26	0.62

Province of Assam during each month of the year 1902.

5							6			7		8			9
June.	July.	August.	September.	October.	November.	December.	Total.			Total ratio of deaths per 1,000 of population.		Total ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous five years.
							Male.	Female.	Total.	Male.	Female.	Male.	Female.	Total.	
501 2,307	462 2,319	352 2,212	284 2,504	308 2,663	323 2,578	398 2,481	2,300 15,471	2,083 12,894	4,383 28,365	10.61 13.56	10.52 11.71	10.57 12.65	15.85 17.67		
2,808	2,781	2,564	2,788	2,971	2,901	2,879	17,771	14,977	32,748	13.09	11.53	12.33	17.29		
1,228 810 771 269 512 274	1,144 763 739 345 461 333	750 653 700 316 504 340	1,040 855 663 294 537 291	1,157 989 772 353 569 411	1,170 1,069 769 335 571 346	1,497 793 690 514 405 312	6,698 5,156 4,667 2,304 3,147 1,989	6,026 4,518 4,004 1,924 2,805 1,693	12,724 9,674 8,671 4,228 5,952 3,682	27.60 17.61 26.51 17.32 9.93 9.98	27.47 15.25 24.83 15.01 9.98 9.84	27.54 16.42 25.71 16.19 9.95 9.91	30.69 19.19 25.32 35.62 10.97 10.04		
3,864	3,785	3,263	3,680	4,251	4,260	4,211	23,961	20,970	44,931	17.61	16.67	17.16	20.47		
6,672	6,566	5,827	6,468	7,222	7,161	7,090	41,732	35,947	77,679*	15.35	14.06	14.72	18.92		

deaths from kala-azar.

Annual Form No. X.—Deaths registered from Dysentery and Diarrhœa

1	2	3	4							
No.	District.	Circles of registration.		Villages.		January.	February.	March.	April.	May.
		Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.	Number in each district.	Number from which deaths from dysentery and diarrhoea were reported.					
	SURMA VALLEY.									
1	Cachar	8	7	379	124	56	48	62	69	97
2	Sylhet	21	20	8,765	1,854	305	298	270	281	410
	Total	29	27	9,144	1,978	361	346	332	350	507
	BRAHMAPUTRA VALLEY.									
3	Goalpara	14	11	1,461	54	6	2	5	13	7
4	Kamrup	9	9	1,716	299	22	24	31	45	76
5	Darrang	12	11	1,275	284	53	46	81	73	92
6	Nowgong	7	7	1,117	179	18	22	17	27	49
7	Sibsagar	12	11	1,124	380	155	105	120	165	160
8	Lakhimpur	6	6	1,123	693	87	80	87	97	127
	Total	60	55	7,816	1,889	341	279	341	420	511
	Total for the Province ...	89	82	16,960	3,867	702	625	673	770	1,018

in the Province of Assam during each month of the year 1902.

5							6			7			8
June.	July.	August.	September.	October.	November.	December.	Total.			Ratio of deaths per 1,000 of population.			Mean ratio per 1,000 for previous five years.
							Male.	Female.	Total.	Male.	Female.	Total.	
108	134	104	92	123	94	86	586	487	1,073	2.70	2.46	2.59	3.79
319	300	321	342	447	539	552	2,427	1,957	4,384	2.13	1.78	1.96	2.75
427	434	425	434	570	633	638	3,013	2,444	5,457	2.22	1.88	2.05	2.91
6	7	8	13	2	10	9	59	29	88	0.24	0.13	0.19	0.45
60	60	97	73	62	59	65	370	304	674	1.26	1.03	1.14	1.32
134	112	91	110	90	79	71	554	478	1,032	3.15	2.96	3.06	4.05
28	20	11	22	20	18	35	172	115	287	1.29	0.90	1.10	1.98
170	147	184	192	226	213	147	1,046	938	1,984	3.30	3.34	3.32	4.98
142	185	241	179	193	164	109	911	780	1,691	4.57	4.53	4.55	5.98
540	531	632	589	593	543	436	3,112	2,644	5,756	2.29	2.10	2.20	3.08
967	965	1,057	1,023	1,163	1,176	1,074	6,125	5,088	11,213	2.25	1.94	2.13	3.00

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Resolution on the Sanitary Report of Assam for 1902.

Extract from the Proceedings of the Chief Commissioner of Assam in the General Department, No. 5912G., dated Shillong, the 28th June 1903.

Read—

The Sanitary Report of the Province of Assam for the year 1902.

RESOLUTION.

The statistics furnished in the Report deal only with the eight plains districts, with a population of 5,275,706. The birth and the death-rate in selected areas in the Khasi and Jaintia Hills and the Garo Hills, and at Kohima in the Naga Hills, with a total population of 81,924, are furnished in paragraph 15 of the Report. Registration in the other parts of the Province, which include a population of 768,713, is not possible. In the plains districts the recorded birth-rate in 1902 was 34·21 per mille, or 5·2 in excess of the recorded death-rate. The excess in 1901 was 6·1. The total number of deaths recorded in 1902 was 153,070, or 29·01 per mille, compared with 146,939 in 1901 and 161,631 in 1900. The average recorded mortality for the 18 years ending 1901 was 153,039, but, in comparing the death-rate of the past year with the average of preceding years allowance must be made for the increase in population and for improvement in registration, and also for the excessive mortality in 1897, *viz.*, 255,629. Though the mortality in 1902 exceeded that of 1901 by over six thousand, every district shows a decrease except Sylhet and Darrang. In Sylhet there was an increase of 11,187, due chiefly to outbreaks of cholera and small-pox, the deaths from the former having increased from 2,805 to 8,804, and from the latter from 2,540 to 5,244. The increase in Darrang (179) was nominal. Save in Sylhet, the year was a healthy one. Deaths from cholera and small-pox showed an increase for the Province of over 5,000 and 3,400 respectively. On the other hand, the mortality from fevers decreased by 6,000, and there was a small decrease in the case of diarrhoea and dysentery. Deaths registered under "other causes" increased by over 3,000, and this is attributed by the Principal Medical Officer and Sanitary Commissioner to more careful diagnosis of the real cause of death. Deaths from *kalá-ázár* are shown to have increased from 5,831 to 6,319, but, for the reason mentioned in paragraph 4 below, it is probable that the mortality in the past year was larger.

The Principal Medical Officer and Sanitary Commissioner has, in compliance with the desire of the Army Sanitary Commission, submitted notes on the meteorology of the Province and the ruling rates of food-grains. Mr. Bolton accepts the opinion that the prices of food grains have no influence on the birth and death-rates in Assam. Famines are unknown in the province, and, though the average standard of comfort may not be high, cases of actual want are rare. Employment is always available for those who seek it, and the large demands for labour on tea gardens and railways have to be met every year by importation of foreign labour. The climatic conditions of the past year appear also to have had no appreciable effect on the public health. The rainfall was above the average in all districts except Lakhimpur, and in Goalpara and Kamrup there were heavy floods. The total mortality, however, was less in both these districts, and the deaths from fever showed a decrease of over 1,300.

Since the close of the year the plague has unfortunately made its appearance in Assam. The first case was reported on the 17th May, and from that date to the 28th June there have been 36 attacks and 27 deaths. The cases have so far occurred only in one quarter of the Dibrugarh town, and strenuous efforts are being made by the local authorities, under the direct supervision of the Commissioner, Mr. Melitus, to prevent the spread of the disease. Vigilance committees have been formed, and there is happily every indication of the desire of the people to co-operate in the measures taken for disinfection. No Assamese have so far been attacked, and the disease is limited to the part of the bazar inhabited by foreign grain merchants. The discovery of dead rats in the grain *golaks* was the first indication of danger, and there is strong reason to believe that the outbreak is due to the importation of infected grain. Precautionary measures are being taken in all districts in communication with Dibrugarh, and the Officiating Chief Commissioner can only trust that the outbreak will be confined to

that place. A Medical Officer with plague experience will be employed for the thorough disinfection of the town, in the hope of preventing the recurrence of the disease during the next cold season.

2. *Registration of vital statistics.*—Registration is compulsory only in municipal areas, with a population of about 108,000 persons, and on tea-gardens, the population of which is about 650,000. The recorded birth-rate in urban areas was 27·43, and the death-rate 28·52 per mille. One hundred and thirty persons were prosecuted for failure to report, of whom 111 were convicted. The largest number of prosecutions were undertaken in Dibrugarh, Tezpur, Gauhati, and Sibsagar. There were no prosecutions in Silchar or Mangaldai (where registration appears to be most inefficient) as well as in four other towns. The enforcement of registration should receive the constant attention of the Deputy Commissioners. The registered birth-rate for the Province was 34·21 and the death-rate 29·01 per mille, the averages for the preceding nine years being 32·50 and 34·14 respectively. Registration was checked by the police, aided in some districts by the vaccination staff, but inspection by the latter agency was generally most inefficient, except in the Sibsagar district. The enquiries made by the police and vaccinating inspectors affected 31·5 per cent. of the births, of which 5·8 per cent. were found to have been left unrecorded, and 29 per cent. of the deaths, of which 5·3 per cent. were unrecorded. The best work was done in the Goalpara, Kamrup, and Sylhet districts. Registration was again defective in the Lakhimpur and Sibsagar districts, where the birth-rates were recorded as 26 and 24 per thousand, and the death-rates as 22 and 18 respectively. In Kamrup and Darrang there was a marked improvement, but much remains to be done before the returns can be accepted as fairly accurate. In the five upper districts of the Brahmaputra Valley the statistics are collected by the gaonbura or village headman, who gets no remuneration. The Administration has submitted a proposal to make a revenue-free grant of $2\frac{2}{3}$ acres of land to each gaonbura, at an estimated cost of Rs. 40,000 per annum.

3. *Infant and child mortality.*—The difficulty of ascertaining the correct ages of children presents a great obstacle to the correct registration of infant and child mortality, and throws doubt on the returns for all districts, although they appear to approach nearer to accuracy in the three districts of Sylhet, Cachar, and Goalpara, where registration is carried out by paid chaukidars. In those districts the recorded death-rates among infants less than a year old were 239 and 238 per thousand, while in Sibsagar and Lakhimpur in the Assam Valley they were as low as 103 and 102. The figures for the different age periods up to 15 years are noticed in the Report. They afford no reliable basis for discussion.

4. *General history of the chief diseases.*—The statement in paragraph 29 compares the deaths from the principal diseases in 1900, 1901, and 1902 with the annual average for the 16 years from 1884 to 1899. The mortality from cholera per mille in 1902 was 2·4, which, though less than the average of the period of 16 years, compares unfavourably with the figure for 1901, *viz.*, 1·4 per mille. There was a severe outbreak in the Sunamganj and Habiganj subdivisions of the Sylhet district. On tea gardens, for which figures of the population in 1902 are not available, owing to a change in the period fixed for the returns, the death-rate among coolies during the past year, calculated on the population of 1901, was higher than among the rest of the population in the districts of the Assam Valley (Nowgong being, however, phenomenally free from cholera) and Cachar, but lower in Sylhet. The number of deaths of garden coolies on steamers and at depôts fell from 2·6 per mille in 1901 to 0·9. The deaths from small-pox were more than double the average of preceding years. In the Surma Valley the death-rate was 2·40, while in the Brahmaputra Valley it was only 0·12. The deaths in Sylhet rose from 2,540 to 5,244 and in Cachar from 84 to 1,125. The increase is attributed to the visits of Ganaks, who practised inoculation. The question whether or not vaccination should be made compulsory in rural areas, and inoculation be prohibited, has again been raised by the Principal Medical Officer, but the Officiating Chief Commissioner is not prepared to consider it in connection with the present annual report. The death-rate from fevers, including deaths from *kalá-ázár*, was 14·72 per mille, compared with 15·36 in 1901: the steady increase in the Darrang district is noticeable, and is probably due to an increase of deaths from *kalá-ázár* in the Mangaldai subdivision. In the Sylhet district, where 2,108 cases of *kalá-ázár* were treated in the dispensaries, only 163 deaths from the disease are returned. The accuracy of this return is obviously open to serious doubt, and an explanation should be obtained and submitted to the Chief Commissioner. The death-rate from dysentery and diarrhoea was smaller than in 1901 in all districts, except Kamrup and Sylhet. Further enquiry should be made to obtain the correct explanation of the high mortality from these diseases returned from the tea-gardens, as compared with the death-rate in

the rest of the population. The opinions of the district medical officers quoted in paragraphs 37 and 38 of the Report are inconclusive, although they indicate that on the gardens deaths from fevers which terminate in bowel complaints are frequently returned under the latter head, this explanation being supported by the fact that fever mortality among garden coolies is shown to be far smaller than in the ordinary population. The Officiating Chief Commissioner desires that this matter may be again discussed in the next Report.

5. *Sanitary Board.*—Two meetings were held during the year. The Board had under consideration, among other matters, the question of introducing Bailey's Patent latrines, which had been favourably reported on after a trial in the Silchar jail. At the suggestion of the Board, the Chief Commissioner has directed that the latrine should be introduced in all jails and hospitals, as opportunity offers, and the Chairmen of Local Boards and Municipalities have had their attention drawn to the patent. No sanitary work of any magnitude was undertaken during the year, but useful work was done by Local Boards in improving the water-supply. The Karimganj, Dhubri and Goalpara Boards, however, spent nothing on conservancy in rural areas, while the expenditure of the Barpeta, Nowgong, Jorhat, and North Lakhimpur Boards was small. The Officiating Chief Commissioner trusts that these Boards will do better in the current year.

By order of the Chief Commissioner of Assam,

F. J. MONAHAN,

Secretary to the Chief Commissioner of Assam.

ANNUAL SANITARY REPORT

OF THE

PROVINCE OF ASSAM

FOR THE YEAR

1902.

BY

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